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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,220	10/23/2003	Andrew C. Gallagher	87032RLO	8212

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EXAMINER

WANG, CLAIRE X

ART UNIT PAPER NUMBER

2624

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/692,220	GALLAGHER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Claire Wang	2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/23/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

1. Claim 1 is objected to because of the following informalities:

In line 9 of claim 1 the word "produced" should be changed to "produce".

Appropriate correction is required.

### Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

3. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-4 and 10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of Patent No. 7,130,485. Although the conflicting claims are not identical, they are not patentably distinct from each other

because the claims of the instant application are broader than those of Patent No.  
7,130,485.

<b>7,130,485</b>	<b>Instant Application</b>
<b>Claim 1</b>	<b>Claim 1</b>
<p>A method of enhancing the tonal and chrominance characteristics of a digital image, comprising the steps of:</p> <p>a) receiving a source digital image including a plurality of pixels wherein the source digital image is in a luminance-chrominance representation having a luminance digital image channel and at least two chrominance digital image channels;</p> <p>b) producing a tone scale function that can be used to enhance the tonal characteristics of the source digital image;</p> <p>c) classifying the tone scale function into one of two or more categories based on the effect the tone scale function will have on the numerical range of pixel values of a processed digital image wherein the classification categories include expansive and compressive;</p> <p>d) using the tone scale function and the luminance digital image channel to produce an enhanced luminance digital image channel; and</p> <p>e) amplifying the chrominance digital image channels to produce modified chrominance digital channels when the tone scale function has been classified as expansive.</p>	<p>A method of applying a tone scale function that is compressive, expansive or a combination of both to a digital image, the method comprising:</p> <p>a) decomposing the tone scale function into two or more composite functions that can be applied sequentially to the digital image;</p> <p>b) applying the first composite function to the digital image with a tone scale applicator to produce a tone scaled digital image; and</p> <p>c) applying the second composite function to the tone scaled digital image to produce an enhanced digital image.</p>

Independent claim 1 of the instant application teaches, "A method of applying a tone scale function that is compressive, expansive or a combination of both to a digital image, the method comprising: a) decomposing the tone scale function into two or more composite functions that can be applied sequentially to the digital image; b) applying the first composite function to the digital image with a tone scale applicator to produce a tone scaled digital image; and c) applying the second composite function to the tone scaled digital image to produced an enhanced digital image." Claim 1 of the instant application does not recite the further limitation of, "receiving a source digital image including a plurality of pixels wherein the source digital image is in a luminance-chrominance representation having a luminance digital image channel and at least two chrominance digital image channels or producing a tone scale function that can be used to enhance the tonal characteristics of the source digital image;" as claimed in Patent No. 7,130,485. However, it would have been obvious to one of ordinary skill in the art to remove this further limitation where that functionality is not required, since omitting this limitation does not prevent the method from functioning properly and the claim is in "comprising" format, indicating other elements could be added.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claim 2 recites the limitation “the maximum slope” and “the minimum slope” in lines 1-2 of claim 2. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 8 recites the limitation “the maximum slope” and “the minimum slope” in lines 1-2 of claim 8. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 101***

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility” (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.

... a signal does not fall within one of the four statutory classes of Sec. 101.

... signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

Claim(s) 10 and 11 is/are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows.

As to Claim 10, it is drawn to functional descriptive material recorded on a computer program product. This claim should recite a "computer readable medium" in accordance with the interim guidelines. However, the specification, at page 6, lines 17-23 defines the claimed computer readable medium as encompassing statutory media such as a "ROM", "hard drive", "optical drive". The definition given in the specification states "a computer readable medium, which may include, for example:" The statement "which may include, for example" could include *non-statutory* subject matter such as a "signal" or "carrier wave".

A "signal" embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Because the full scope of the claim as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory. The examiner suggests amending the claim to include the disclosed tangible computer readable media, while at the same time excluding the intangible media such as signals, carrier waves, etc. Any amendment to the claim should be commensurate with its corresponding disclosure.

As to Claim 11 it is analyzed in the same way as claim 10. Please see above for detail analysis.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. Claim 1, 5 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Shaw et al. (US 6,792,160 B2).

As to claim 1, Shaw et al. (from this point forward will be referred to as Shaw) teaches a method of applying a tone scale function that is compressive, expansive or a combination of both to a digital image (the tone function has the effect of expanding contrast in the shadow regions; Col. 5, lines 46-47), the method comprising: a)



decomposing the tone scale function (for each pixel value derive at least one tone function; Fig. 1) into two or more composite functions that can be applied sequentially to the digital image (derive a first tone function and then deriving a second tone function; Fig. 3); b) applying the first composite function to the digital image with a tone scale applicator to produce a tone scaled digital image (Fig. 4A shows the output of the first tone curve); and c) applying the second composite function to the tone scaled digital image to produced an enhanced digital image (Fig. 4B shows the output of the second tone curve ).

As to claim 5, the only difference between claim 5 and claim 1 is that in claim 5 there is the mention of a spatial filter (image filter; 50 Fig. 5).

As to claim 6, Shaw teaches wherein the spatial filter is designed to remove noise, enhance or preserve detail or both (the filter is used to obtain local average pixel values from highlight and shadow functions and thus reducing irrelevant data; Col. 7, lines 7-15).

As to claim 2, Shaw teaches wherein the first composite function is  $T_{sub.1}(x)$ , the second composite function is  $T_{sub.2}(x)$ , the tone scale function is  $T(x)$  and the tone scale function  $T(x)$  is substantially equal to  $T_{sub.2}(T_{sub.1}(x))$ , wherein  $x$  is a pixel value (Official notice: this is a method of linear function decomposition where it is clear that when breaking a function into two parts that putting the parts back together will result in substantially the same function).

As to claim 7, it is the same as claim 2 and thus will be analyzed in the same manner. See claim 2 for detail analysis.

As to claim 10, it is a computer program product of claim 1 (Computer system; Fig. 6).

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 3,4,8,9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al. (US 6,792,160 B2) in view of Lee (US 6,285,798 B1).

As to claim 3. Shaw does not teach wherein the maximum slope is greater than or equal to the minimum slope of the second composite function when plotted as a function of input versus output. Lee teaches of shadow slope and a highlight slope, where highlight slope is set to one and the preferred value of the shadow slope is one (Col. 8, lines 15-27). Thus the slopes of Lee reads on the claimed slope values. Therefore, it would have been obvious to one ordinarily skilled in the art at the time of the invention to have combined the slopes of Lee with the tone functions of Shaw in order to ensure that excessive quantization due to too high or too low slopes will not occur (Col. 8, lines 34-37).

As to claim 8, it is the same as claim 3 and thus will be analyzed in the same manner. See claim 3 for detail analysis.

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As to claim 4, Shaw does not teach wherein the maximum and minimum slopes are equal to 1. Lee teaches of shadow slope and a highlight slope, where highlight slope is set to one and the preferred value of the shadow slope is one (Col. 8, lines 15-27). Thus the slopes of Lee reads on the claimed slope values. Therefore, it would have been obvious to one ordinarily skilled in the art at the time of the invention to have combined the slopes of Lee with the tone functions of Shaw in order to ensure that excessive quantization due to too high or too low slopes will not occur (Col. 8, lines 34-37).

As to claim 9, it is the same as claim 4 and thus will be analyzed in the same way. See claim 4 for detail analysis.

As to claim 11, it is a computer program product of claim 3 (Lee teaches of an automatic tone adjustment method for computer processing of digital images; Col. 1, lines 12-13).

***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Holm (US 6,563,945 B2) teaches of a pictorial digital image processing incorporating image and output device modifications.

Gallagher et al. (US 6,317,521 B1) teaches a method for preserving image detail when adjusting the contrast.

Tastl et al. (US 6,993,200 B2) teaches a method for rendering high dynamic range images.

Boyack et al. (US 5,724,456) teaches brightness adjustment of images using digital scene analysis.

Lee et al. (US 5,541,028) teaches constructing tone scale curves.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang  
11/9/2006



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